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**Ecology** is the branch of biology, which studies the interactions among organisms and their environment. Objects of study include interactions of organisms with each other and with lifeless components of their environment. Topics of interest include the biodiversity, distribution, biomass, and populations of organisms, as well as cooperation and competition within and between species. Ecosystems are dynamically interacting systems of organisms, the communities they make up, and the non-present components of their environment.

# Organisms

In biology, an **organism** is any separate entity that exhibits the properties of life. It is a analogue for "life form".

**Organisms** are classified by taxonomy into specified groups such as the multicellular animals, plants, and fungi; or unicellular microorganisms such as a protists, bacteria, and archaea.All types of **organisms** are capable of reproduction, growth and development, maintenance, and some degree of response to stimuli. Humans are multicellular animals composed of many trillions of cells which differentiate during development into specialized tissues and organs.

Estimates on the number of Earth's current species range from 10 million to 14 million,of which only about 1.2 million have been documented.More than 99% of all species, amounting to over five billion species, that ever lived are estimated to be extinct. In 2016, a set of 355 genes from the last universal common ancestor (LUCA) of all living **organisms** living was identified.

## Σημαντικά γεγονότα

An **organism** may be either a prokaryote or a eukaryote:

## Γεγονός 1

Prokaryotes are represented by two separate domains—bacteria and archaea.

## Γεγονός 2

Eukaryotic **organisms** are characterized by the presence of a membrane-bound cell nucleus and contain additional membrane-bound compartments called organelles (such as mitochondria in animals and plants and plastids in plants and algae, all generally considered to be derived from endosymbiotic bacteria).Fungi, animals and plants are examples of kingdoms of **organisms** within the eukaryotes.

# BIODIVERSITY

**Biodiversity**, a portmanteau of "bio" (life) and "diversity", generally refers to the variety and variability of life on Earth. According to the United Nations Environment Programme (UNEP), **biodiversity** typically measures variation at the genetic, the species, and the ecosystem level. Terrestrial **biodiversity** tends to be greater near the equator, which seems to be the result of the warm climate and high primary productivity. **Biodiversity** is not distributed evenly on Earth, and is richest in the tropics. These tropical forest ecosystems cover less than 10 percent of earth's surface, and contain about 90 percent of the world's species. Marine **biodiversity** tends to be highest along coasts in the Western Pacific, where sea surface temperature is highest, and in the mid-latitudinal band in all oceans. There are latitudinal gradients in species diversity. Biodiversity generally tends to cluster in hotspots, and has been increasing through time, but will be likely to slow in the future.

## Σημαντικά γεγονότα

Rapid environmental changes typically cause mass extinctions. More than 99.9 percent of all species that ever lived on Earth, amounting to over five billion species, are estimated to be extinct. Since life began on Earth, five major mass extinctions and several minor events have led to large and sudden drops in **biodiversity**.

## Γεγονός 1

Estimates on the number of Earth's current species range from 10 million to 14 million, of which about 1.2 million have been documented and over 86 percent have not yet been described. More recently, in May 2016, scientists reported that 1 trillion species are estimated to be on Earth currently with only one-thousandth of one percent described.

## Γεγονός 2

The total amount of related DNA base pairs on Earth is estimated at 5.0 x 1037 and weighs 50 billion tonnes. In comparison, the total mass of the biosphere has been estimated to be as much as 4 TtC (trillion tons of carbon). In July 2016, scientists reported identifying a set of 355 genes from the Last Universal Common Ancestor (LUCA) of all organisms living on Earth.

## Γεγονός 3

The Phanerozoic eon (the last 540 million years) marked a rapid growth in **biodiversity** via the Cambrian explosion—a period during which the majority of multicellular phyla first appeared.The next 400 million years included repeated, massive **biodiversity** losses classified as mass extinction events.

## Γεγονός 4

In the Carboniferous, rainforest collapse led to a great loss of plant and animal life. The Permian–Triassic extinction event, 251 million years ago, was the worst; vertebrate recovery took 30 million years. The most recent, the Cretaceous–Paleogene extinction event, occurred 65 million years ago and has often attracted more attention than others because it resulted in the extinction of the dinosaurs

# ECOSYSTEM

An **ecosystem** is a community made up of living organisms and nonliving components such as air, water and mineral soil, all interacting as a system.However, **ecosystems** can be defined in many ways. The biotic and abiotic components interact through nutrient cycles and energy flows**. Ecosystems** are the network of interactions among organisms, and between organisms and their environment.**Ecosystems** can be of any size but one ecosystem has a specific, limited space. On a larger scale, some scientists view the entire planet as one **ecosystem**.

## Σημαντικά γεγονότα

Energy, water, nitrogen and soil minerals are other essential abiotic components of an **ecosystem**. The energy that flows through **ecosystems** comes primarily from the sun, through photosynthesis. Photosynthesis also captures carbon dioxide from the atmosphere. Animals also play an important role in the movement of matter and energy through **ecoystems**. They influence the amount plant and microbial biomass that lives in the system. As organic matter dies, decomposers release carbon back to the atmosphere. This process also facilitates nutrient cycling by converting nutrients stored in dead biomass back to a form that can be used again by plants and other microbes. **Ecosystems** are controlled both by external and internal factors.

## Γεγονός 1

External factors such as climate, the parent material that forms the soil, topography and time have a big impact on **ecosystems,** but they are not themselves influenced by the ecosystem. **Ecosystems** are dynamic: they are subject to periodic disturbances and are in the process of recovering from past disturbances that were external to the **ecosystem.**

## Γεγονός 2

Internal factors are different. They not only control **ecosystem** processes but are also controlled by them. Internal factors are subject to feedback loops.

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| Complex Table(less accessible)  Class Schedule   |  |  |  |  |  | | --- | --- | --- | --- | --- | | LESSON | TOPIC | ASSIGNMENT | Points | DUE | | 1 | What is Distance  Learning? | Wiki #1 | 10 | March 10 | | Presentation | 20 |  | | 2 | History &  Theories | Brief Paper | 20 | March 24 | |  | Spring Break | |  | | | 3 | Distance  Learners | Discussion #1 | 10 | April 7 | | Group Project | 50 | April 14 | | 4 | Media Selection | Blog #1 | 10 | April 21 | |

# BIOMASS



**Biomass** is the mass of living biological organisms in a given area or ecosystem at a given time. **Biomass** can refer to species biomass, which is the mass of one or more species, or to community **biomass**, which is the mass of all species in the community. It can include microorganisms, plants or animals. The mass can be expressed as the average mass per unit area, or as the total mass in the community

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## Σημαντικά γεγονότα

How **biomass** is measured depends on why it is being measured. Sometimes, the **biomass** is regarded as the natural mass of organisms in situ, just as they are. For example, in a salmon fishery, the salmon biomass might be regarded as the total wet weight the salmon would have if they were taken out of the water.

## Γεγονός 1

In other contexts, **biomass** can be measured in terms of the dried organic mass, so perhaps only 30% of the actual weight might count, the rest being water. For other purposes, only biological tissues count, and teeth, bones and shells are excluded.

## Γεγονός 2

In some applications**, biomass** is measured as the mass of organically bound carbon (C) that is present.

## Γεγονός 3

Apart from bacteria, the total live biomass on Earth is about 560 billion tonnes C,[1] and the total annual primary production of **biomass** is just over 100 billion tonnes C/yr.

## Γεγονός 4

The total live **biomass** of bacteria may be as much as that of plants and animals or may be much less.The total amount of DNA base pairs on Earth, as a possible approximation of global biodiversity, is estimated at 5.0 x 1037, and weighs 50 billion tonnes. In comparison, the total mass of the biosphere has been estimated to be as much as 4 x 1012 tonnes of carbon.

# POPULATION

In biology, **a population** is all the organisms of the same group or species, which live in a particular geographical area, and have the capability of interbreeding.The area that is used to define a sexual **population** is defined as the area where inter-breeding is potentially possible between any pair within the area, and where the probability of interbreeding is greater than the probability of cross-breeding with individuals from other areas.

## Σημαντικά γεγονότα

In sociology**, population** refers to a collection of humans. Demography is a social science which entails the statistical study of human populations.

## Γεγονός 1

**Population** in simpler terms is the number of people in a city or town, region, country or world.

## Γεγονός 2

**Population** is usually determined by a process called census (a process of collecting, analyzing, compiling and publishing data).

ΓΕΝΕΑΛΟΓΙΚΟ ΔΕΝΤΡΟ

<<Η οικογένεια μου>>